CLAIMS

1. A single layer anti-reflective hard-coat.
2. A single layer anti-reflective hard-coat according to claim 1 that comprises a structured surface, preferably a nano-structured surface.
3. A hard-coat according to claim 1 or 2, comprising a material with a hardness above 0.5 GPa, preferably above 0.7 GPa and most preferably above 1.0 GPa as measured by nano-indentation.
4. A hard-coat according to claims 1 to 3 comprising a material with a reduced tensile modulus above 3 GPa, preferably above 8.5 GPa or 20 GPa, most preferably above 40 GPa as measured by nano-indentation.
5. A hard-coat according to claims 1 to 4 comprising a material with a scratch resistance above 5 mJ μm^{-3}, preferably above 15 or 30 mJ μm^{-3}, preferably above 60 mJ μm^{-3} as measured by nano-indentation.
6. A hard-coat according to claims 1 to 5 containing an amount of inorganic nano-particles from 5 to 75 weight %, preferably from 15 to 50 weight %.
7. A single layer hard-coat wherein the hard-coat exhibits a refractive index gradient normal to the substrate that decreases from that of the material of the hard-coat to that of air over a spatial length scale.
8. A single layer hard-coat according to claim 7 wherein the spatial length scale of the refractive index gradient is between 10 and 1000 nm.
9. A single layer hard-coat according to claim 8 wherein the spatial length scale of the refractive index gradient is between 100 and 200 nm.
10. A single layer hard-coat according to any preceding claim wherein the critical wave vector of the radial fourier density transformation for an uncorrelated density distribution is below 2 pi / 600 nm.
11. A single layer hard-coat according to claim 10 wherein the critical wave vector of the radial fourier density transformation for an uncorrelated density distribution is below 2 pi / 400 nm.
12. A single layer hard-coat according to any preceding claim wherein the hard-coat increases the optical transmission of a substrate in at least a range of wavelengths of the electromagnetic spectrum.

13. A process for preparing a single layer hard-coat, comprising the steps of
    a) applying a mixture on a substrate, which mixture comprises
        i. at least a first material which does not crosslink under the conditions chosen in step b)
        ii. at least a second material which does crosslink under the conditions chosen in step b)
        iii. nano-particles, and
        iv. optionally at least one solvent
    b) inducing crosslinking in the mixture applied to the substrate, subsequently removing at least part of the first material.
14. A process according to claim 13 wherein the mixture is homogenous prior to crosslinking
15. A process according to claims 13 or 14 wherein at least part of the nano-particles have organic groups on their surface.
16. A process according to claims 13 to 15, wherein the nano-particles are inorganic nano-particles.
17. A process according to any one of claims 13-16, wherein the monomer or oligomer present in the second material has at least two and preferably three or more reactive / polymerizable or crosslinkable groups per monomer or oligomer molecule
18. A process according to claim 13 to 17 wherein the majority of the nano-particles have a diameter of less than 400 nm and preferably less than 50 nm.
19. A hard-coat obtainable by the process according to any one of claims 13 to 18.
20. Shaped articles comprising a hard-coat according to claims 1 to 12 or claim 19.